

# *Gulf Cooperation Council*

## EDICT OF GOVERNMENT

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GSO 132 (2011) (English): PLASTIC BOTTLES USED FOR  
BOTTLING CHEMICAL MATERIALS AND PRODUCTS (Draft  
Standard)



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**هيئة التقييس لدول مجلس التعاون لدول الخليج العربية**  
**STANDARDIZATION ORGANIZATION FOR G.C.C (GSO)**

مشروع: نهائي

**GSO FDS 13٢ /201١**

**PLASTIC BOTTLES  
USED FOR BOTTLING CHEMICAL  
MATERIALS AND PRODUCTS**

إعداد  
اللجنة الفنية الخليجية لقطاع مواصفات الكيمياء و الغزل و النسيج

هذه الوثيقة مشروع لمواصفة قياسية خليجية تم توزيعها لإبداء الرأي والملاحظات بشأنها ، لذلك فإنها عرضة للتغير والتعديل ، ولا يجوز الرجوع إليها كواصفة قياسية خليجية إلا بعد اعتمادها من مجلس إدارة الهيئة.

**ICS: 5.100**

# **PLASTIC BOTTLES USED FOR BOTTLING CHEMICAL MATERIALS AND PRODUCTS**

**Date of GSO Board of Directors Approval :  
Issuing Status : Technical Regulation**

## Foreword

GCC Standardization Organization (GSO) is a regional Organization which consists of the National Standards Bodies of GCC member States. One of GSO main functions is to issue Gulf Standards /Technical regulations through specialized technical committees (TCs).

GSO through the technical program of committee TC No. 1 "Gulf TC of Chemical and Textile " has updated GSO 132:1990 *"Plastic bottles used for bottling chemical materials and products "*. The Draft Standard has been prepared by (United Arab Emirates).

This standard has been approved as a Gulf Standard) without any technical modifications by GSO Board of Directors in its meeting No.(     ),held on     /  
/     H ,     /     /     G.

# **PLASTIC BOTTLES USED FOR BOTTLING CHEMICAL MATERIALS AND PRODUCTS**

## **1- SCOPE AND FIELD OF APPLICATION**

This Gulf standard specifies general regulations to be fulfilled in plastic bottles used for bottling chemical materials and products intended for the delivery, transport, storage and their methods of testing and inspection.

## **2- COMPLEMENTARY REFERENCES**

- 2.1 GSO 1810:2007 "Labelling- Labelling of Chemical Products".
- 2.2 ASTM D 2911: 2010 "Standard Specification for Dimensions and Tolerances For Plastic bottles".

## **3- DESCRIPTION (CHEMICAL COMPOSITION)**

Plastic bottles are manufactured from polystyrene, polyethylene, formaldehyde or any other suitable material. The type of bottle material depends on the chemical substance to be bottled whether a solid or a liquid material.

## **4- GENERAL REGULATIONS**

Bottles must fulfill the following requirements:

- 4.1 The material of bottles shall not be composed of any degradable or biodegradable polymers or any pro-degradant additive.
- 4.2 Capacities of bottles shall not be changed at room temperature 20-25 ° C and shall always be specified under the same temperature.
- 4.3 Dimensions and tolerances for plastic bottles shall be complying with item 2.۲.
- 4.4 The material of bottles shall be complying with the relevant standards. It shall be homogeneous, free from foreign matters, bulging, air pockets and also from manufacturing defects.
- 4.5 Bottles surface shall be homogeneous in colour and gloss, when tested according to item 7.2.1.
- 4.6 Components of bottles material shall not detrimentally affect general health or environment. It shall not make change in the composition and characteristics of the filled material. It shall be inert and suitable for the product to be bottled.

- 4.7 Bottles material shall be free from any odour up to the permissible limit agreed between the buyer and vendor on contracting.
- 4.8 Product thickness shall be suitable for its shape and the intended use.
- 4.9 No change in shape or dimensions shall happen to the bottles before bottling if kept in a place where the temperature is between  $-40^{\circ}\text{C}$  and  $+60^{\circ}\text{C}$  under shade when tested according to items 7.2.5 and 7.2.6.
- 4.10 Bottles shall resist hazards of normal transport and handling without breakage or cleavage.
- 4.11 Ink used for printing and colouring materials for plastic shall comply with the respective standards. It shall not stain the filled materials, when tested according to item 7.2.10
- 4.12 Covers of the bottles shall be suitable and designed to close tightly so that, if the bottle is bottled, then turned upside down or subjected to vibration, the cover shall stay in its place and no leakage of the filled material happens.
- 4.13 Agreement shall be settled between the buyer and vendor on contracting for the kind of plastic of which the product is made.
- 4.14 Bottles shall be produced in colours which are agreed between the buyer and vendor on contracting.
- 4.15 Water shall not leak from the bottle when tested according to item 7.2.2.
- 4.16 The bottle must be tight enough to prevent the passage of humidity when tested according to item 7.2.3.
- 4.17 The value of the toxic substances such as lead, copper, mercury, cadmium, hexavalent chromium and cyanide extracted from the internal surfaces of the bottles shall not exceed the permissible limit when tested according to item 7.2.4.
- 4.18 In case of closed bottles, they shall not crack or break when dropped randomly three times from a height of 75 cm on a solid surface when tested according to item 7.2.7.
- 4.19 Bottles/ shall not be affected by the dilute acids or dilute alkali when tested according to items 7.2.8 and 7.2.9.
- 4.20 The pH of an aqueous solution present inside the bottles for one hour shall be between 6 and 8.
- 4.21 Bottles shall be against transmission of air, gas barrier, light, UV radiation, moisture vapours, aromas or any other volatiles.

## **5- LABELLING AND MARKING**

The labelling information for filled chemical materials or products shall be stated according to item 2.1.

Also the following information shall be stated clearly and legibly in Arabic or in both Arabic And English on outer box container and marked on each bottle:

- 5.1 Producer's name or his registered trademark.
- 5.2 Country of origin.
- 5.3 Bottle capacity in metric units.
- 5.4 Batch number and date, in month and year.
- 5.5 Kind of plastic of which the bottles are made.
- 5.6 Recycling Symbols if existed (ANNEX A).

## **6- PACKAGING**

Every group of the bottles shall be packed in a suitable outer container, complying with the relevant standards, to protect it from breakage, dirt, and dust aggregation.

## **7- METHODS OF TESTING AND INSPECTION**

### **7.1 Sampling**

The method of sampling for testing shall be as agreed between the manufacturer or the supplier and the buyer. In any time, the number of samples tested shall not be less than 5 samples from the same type and volume.

### **7.2 Tests**

#### **7.2.1 Smooth surface test**

The aim of this test is to ensure that the surface is smooth to prevent the dirty of the surface or the quick staining by the different organic dyes present in the bottled materials.

##### **7.2.1.1 Reagents**

- a. 0.01% Rhodamine solution acidified by drops of acetic acid.
- b. 0.01% Methyl blue solution acidified by the same acid.

##### **7.2.1.2 Method**

Immerse the bottle in one of the above reagents and then boil it for ten minutes. Remove the bottle from the solution and wash with water then rub with a piece of cloth. Rinse, dry and inspect the bottle in case of appearance of any spots.

##### **7.2.1.3 Results**

The absence of spots on the bottle surface.



- 7.2.2 Water leakage test
- 7.2.2.1 Method
- Fill the bottle with coloured water, then fit the closure and dry carefully from outside, put the bottle upside down for one hour.
- 7.2.2.2 Result
- Watch that water does not leak outside through the fitness of the closure.
- 7.2.3 Test for humidity permeability
- 7.2.3.1 Method
- Put the coloured dried silica gel in the bottle and leave it open in the air for 24 hours.
- 7.2.3.2 Result
- No change in the colour of silica gel shall occur as a result of the leakage of humidity.
- 7.2.4 Test for absence of toxic substance traces
- 7.2.4.1 Method
- Fill the bottle with distilled water free from the toxic substances written in item 3.14 for 72 hours at room temperature. Carry out the tests for these substances in water present in the bottle according to the methods used for inspection.
- 7.2.4.2 Result
- The value shall not exceed the permissible limit.
- 7.2.5 Test for resistance to low temperature
- 7.2.5.1 Method
- Expose the bottle to a temperature of  $-40^{\circ}\text{C}$  for 24 hours then remove the bottle and leave it to reach the room temperature.
- 7.2.5.2 Result
- The bottle shall not show any cleavages, nor shall show any twisting or folds in its surface. The change in the bottle capacity shall not exceed 4% of the nominal capacity.
- 7.2.6 Test for resistance to dry heat
- 7.2.6.1 Method
- Put the bottle in an oven with an air current of a temperature of  $(60 \pm 2)^{\circ}\text{C}$  for one hour, remove it from the oven and leave it to cool.
- 7.2.6.2 Result

The bottle shall not show any cracking, twisting or swelling. The change in the bottle capacity shall not exceed 4% of the nominal capacity.

7.2.7 Drop test

7.2.7.1 Method

Fill the bottle with water, close well, then drop it randomly three times from a height of 75 cm on a solid surface.

7.2.7.2 Result

No cleavage or breakage will happen to the bottle wall.

7.2.8 Test for resistance to dilute acids

7.2.8.1 Reagents

Prepare three solutions, the concentration of each 5%, from acetic, citric and hydrochloric acids.

7.2.8.2 Method

Put a maximum of 15 drops to form a spot on the bottle surface from each of the above prepared reagents each alone (no interference of the spots occur) by the aid of pipette, then leave them for 4 hours and wash with water.

7.2.8.3 Result

No folds, cavities, change in the colour or corrosion in the bottle shall happen after the end of the test.

7.2.9 Test for resistance to dilute alkali

7.2.9.1 Reagents

2% sodium carbonate solution.

7.2.9.2 Method

Immerse the bottle in the above solution for one hour then rinse with water to remove any traces of sodium carbonate.

7.2.9.3 Result

As item 7/2/8/3.

7.2.10 Sprinkle colour test

7.2.10.1 Method

Put the test specimen (square 50 x 50 mm, taken directly from the bottle to be tested) on a piece of polyvinyl chloride (non-coloured and transparent, having the same dimensions) and cover it with a filter paper. Put the group between 2 glass plates and leave it for 72 hours in air oven at a temperature of  $(60 \pm 2)^{\circ}\text{C}$ . Separate the contents of this group and examine the presence of any colour or sign on the polyvinyl chloride piece or on the filter paper.

7.2.10.2 Result






No sprinkle colour shall appear on the polyvinyl chloride piece or in the filter









## **8- RERERENCES**









- Guides for the Use of Environmental Marketing Claims

















## **ANNEX A**


## RECYCLING SYMBOLS

#	Symbol	Claim
1		'This product can be recycled' or 'Recyclable'
2		'This product was manufactured with at least some materials that have been recycled'
3		' Percentage of the product has been made from recycled materials'
4		'The outer black circle denotes that at least some content came from recycled material'
5		<p>Polyethylene Terephthalate (PETE or PET, and PETG)</p> <p>Polyethylene Terephthalate Glycol</p>

6	 <b>HDPE</b>  <b>PE - HD</b>	High Density Polyethylene (HDPE)
7	 <b>PVC</b>  <b>V</b>	Polyvinyl Chloride (PVC, sometimes V)
8	 <b>LDPE</b>  <b>PE-LD</b>  <b>PE - LD</b>  <b>L.L.D.P.E.</b>	Low Density Polyethylene (LDPE)

9	 <b>PP</b> 	Polypropylene (PP)
10	 <b>PS</b>	Polystyrene (PS)
11	 <b>OTHER</b>	Other
12	 <b>RPET</b>  <b>RHDPE</b>  <b>RPVC</b>  <b>RLDPE</b>	R-resins: ALREADY RECYCLED

	 	
13	             	<p>Resin Symbols without Acronyms and their Alternatives</p>

14		Acrylonitrile Butadiene Styrene (ABS)
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